

Observational Studies of a Trauma Care Team in Support of Interface Design

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Introduction. The interface to a decision-support system must be designed around the communicative practices and needs of its intended audience, if the system is to be effective. *Interface* here includes a variety of aspects of communication between the system and its users. We present results of observational studies at one hospital that are relevant to the interface design of an implemented trauma decision-support system, called TraumAID.

TraumAID employs three different kinds of communication with users: collecting/requesting information, offering information, and suggesting actions. We have been studying these three facets of communication among trauma team members. We describe the elements of intra-team communication that were studied, focussing on those elements relevant to the introduction of real-time computer-based decision support. Since the study set was fairly small, and since different hospitals have different communication and care patterns, this work can be seen more as a way of studying aspects of trauma-care communication that may be relevant to medical informatics, than as a generalizable set of descriptions about medical teams.

The Study. Ten cases of acute trauma were selected for study, and the videotapes of the cases transcribed. The case transcriptions along with the scribe nurse's trauma flow sheet for the cases were the basis of this study, with analysis performed on 1004 utterances of information, 682 requests for information, and 602 requests for action.

For spoken information, our focus was on (1) what kind of information was given, by whom, whether it was prompted by someone else's question, and whether it was repeated; and (2) what information got recorded on the flow sheet, and where. The first set of questions is relevant to how active a system needs to be in requesting information; the second to assessing the potential for information to get entered into the record or the system, correctly and in its correct place. The scribe nurse's chart has specific slots for particular items of information to be entered, as well as having space

for entering any information in free text. We refer to information that corresponds to a specific slot on the chart as "chart information", and the nurse charged with charting as the "scribe nurse".

With requests for information we were interested in what kind of information was asked for, who asked for it, who they asked, and whether they got answers. For requests for action, we looked at whether the form of the request made a difference in whether the action was done.

Results. We found that the person running the case and the nurses tended to verbalize information more than other roles, and that the person running the case and the scribe nurse tended to ask for information more. Chief residents, who typically run the case, give the most orders. Some specific points that are relevant to the interaction between a computer system and trauma team include that people in different roles seem to have different motivations for collecting or conveying information, so it may be useful to orient a system's information-gathering queries toward specific roles—in our case, the nurses seemed interested in getting information recorded, while the person in charge balanced that with keeping the attending doctor informed; that the system must take initiative in gathering information and not assume that all relevant information will be automatically entered, since some information was never recorded, and since half of all spoken information was offered only in response to a request for it; that a small amount of information is entered erroneously, or only entered in free text, so it may be useful to allow free-text entry if free-text data extraction is provided; that a quarter of questions asked did not get answered, although the reasons for this are not clear, and repeating the question does not seem to help a lot; that people are more likely to comply with unambiguous orders, and less likely to comply with orders hedged by indirectness or politeness.

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